N F E S C

Naval Facilities Engineering Service Center
1100 23rd Avenue
Port Hueneme, CA 93043-4370

S O L U T I O N S Q U A R T E R L Y

Desert Blast Certifies New Magazine

A breakthrough in munitions storage was proven with a successful test of a new high performance (HP) magazine. Now Navy real estate managers can reduce the amount of land dedicated to storing munitions, or conversely, may store more munitions per acre. This leap forward comes at a cost nearly equivalent to the cost of a conventional ordnance magazine.

Last October, 60,000 pounds of explosives (288 MK82 and 4 MK84 bombs) were detonated at the Naval Air Warfare Center, China Lake, CA, in a final test to certify the safety of the ESC's HP magazine. The test proved conclusively that the design prevents sympathetic detonation of ordnance stored in compart-mentalized storage cells. Captain John Walsh, Ordnance Officer for the Commander-in-Chief, Atlantic Fleet, representing both the Atlantic and Pacific Fleets, made a post-test inspection of the site.

The non-earth-covered HP magazine requires less stand-off distance to inhabited buildings or public roadways than a conventional earth-covered magazine. Previous technology limited the net explosives storage density to about 371 pounds per acre of encumbered land. The HP magazine increases this to 2,222 pounds per acre, dramatically reducing encumbered land. Earth berms extend only to the top of the HP magazine's ordnance storage pits. A lightweight pre-engineered metal building provides protection from weather for ordnance loading and unloading.

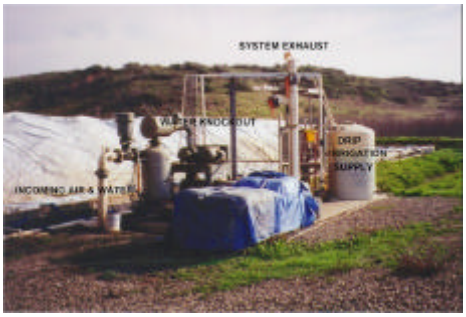
The "high performance" of the HP magazine comes from reducing the maximum credible event (MCE) that is used to establish the explosives safety quantity distance (ESQD) arc. Movable and permanent interior walls are designed to prevent sympathetic detonation between individual storage cells and between any closed storage cell and the shipping and receiving area. The MCE in an HP magazine storing over 300,000 pounds net explosive weight (NEW) does not exceed 60,000 pounds NEW, which is a combination of the explosives contained in any open individual storage cell and the shipping and receiving area.

(*Continued on page 3)*

Biopiles Save a Pile

The bioremediation experts of the ESC and Marine Corps Base, Camp Pendelton, CA, have teamed to create a unique 7-acre bioremediation facility designed to treat hydrocarbon impacted soil. The facility consists of a pre-treatment soil storage area, two soil treatment pads, and a post-treatment storage area. The facility is operated under Waste Discharge Requirements (WDRs) established by the Region 9 Water Quality Control Board.

As part of Camp Pendelton's overall environmental compliance program, more than 100 Underground Storage Tanks (USTs) are being assessed and cleaned up. Investigation, replacement, and/or remedial activities for the USTs have identified soils affected by diesel and jet fuel leaks. By using bioremediation, soil treatment costs vary from $19 to $24 per ton, depending on contamination levels and regulatory requirements. Cost to dispose of untreated hydrocarbon contaminated soil can run from $125 to $250 per ton.



Blower Skid for MCB, Camp Pendleton biotreatment facility.

For more information on this project, contact **Robert Kratzke** at (805) 982-4853, DSN: 551-4853, or e-mail: rkratzk@ nfesc.navy.mil.

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Pier Power Monitoring Breakthrough

Imagine, as a Navy facility manager, being able to know exactly how much shore power each individual ship is using at any given time. You could use that information to shave demand at peak hours, better manage consumption, and bill individual users. Naval ships connected to shore power use 22 percent of the Navy's infrastructure electricity. Having the ability to monitor and manage that consumption is very appealing, but is currently very complex.

Measuring and recording ship power use is complicated by the current power delivery system between the pier and ship. In order to meet the full electricity needs of each ship, multiple cables are used to bring power from the pier to the ship. The multiple cable requirement precludes using conventional electric power recording equipment. Power measurement is further complicated because ships are often "nested" together with each ship drawing its power from the same group of pier power receptacles.

The ESC has developed a power measurement system for this unique situation. The solution, the Pier Power Monitoring System (PPMS), consists of a specialized embedded computer circuit board, embedded software, and personal computer (PC) software that enables Public Works Centers to measure, record, and study the electricity consumption and usage patterns of ships connected to the pier power delivery system.

The PPMS was developed to be cost effective, easy to install, and simple-to-use connection to a conventional utility metering system. Typically, each monitored pier mound will have one set of circuit boards installed. Battery backup assures that no data or operating software are lost when power is disconnected. The data are sent back to a PC at a central location. The PC can program the remote units and retrieve data. Parameters available on the PC are megawatt-hours, instantaneous amps, volts, power factor, and megawatts. Time-of-Use (TOU) data are also available for the present 24-hour period and the previous 24-hour period. For each ship, the PPMS correctly identifies the receptacles allocated and total power consumed.

Both customer and provider can easily track shore-supplied ship electricity. Software can be easily tailored to send the data directly from the pier hardware to a master data collection and billing system. By providing complete energy use pattern information and consumption data, the PPMS enables Navy managers to educate, monitor, and encourage energy conservation for ships using shore-supplied electricity.

An operating PPMS demonstration system is presently installed on Pier 1 at Naval Station San Diego, CA.

For more information, contact **Ron Vincent** at (805) 982-1367, DSN: 551-1367, or e-mail: rvincent@nfesc.navy.mil.

Correction

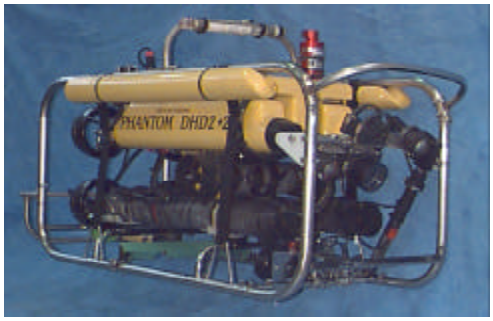
The September-December 1996 issue of Solutions Quarterly stated that a physical security site assessment conducted at the Philadelphia Naval Base generated a $500 million savings in annual operating costs. Many of you were surely impressed! Truthfully, the savings was $500 *thousand* annually. My apologies. The Editor.

SOLUTIONS QUARTERLY

Commanding Officer ..... Captain D. G. Morris
PublicAffairs Officer and Editor ..... Lori Lee
The ***Solutions Quarterly*** is published using appropriated funds in compliance with NPPR-36 (Rev. May 1979). Views and opinions expressed herein are not necessarily those of the Department of Defense, the Navy, Commanding Officer NFESC, or the editorial staff. Inquiries are welcome. Address inquiries to: Public Affairs Officer, NFESC, 1100 23rd Avenue, Port Hueneme, CA 93043-4370. All photos are official Navy Department photographs unless otherwise stated.

Phantom to the Rescue

In a last chance effort, the ESC's Phantom DHD2+ Remotely Operated Vehicle (ROV) and crew recovered three acoustic doppler current profilers (ADCP) from the depths of the Yellow Sea. In April, the ROV was mobilized onto the **USNS SILAS BENT** (T-AGS/26) to conduct the recoveries in water depths ranging from 100 to 500 feet. The ADCPs' acoustic releases had become fouled, leaving the profilers, valued at $460,000, and their collection of data stranded, on the seafloor. A previous attempt by a commercial company in 1995 failed to recover any of the ADCP.



The ROV maneuvered through trawl nets, lines abandoned from the previous attempt, and bottom debris to attach recovery lines to the 1,800-pound profilers and supporting hardware. One of the profilers was fouled on four abandoned trawl nets and suspended in the water column. Complicating the recovery, visibility at times was less than 6 inches and water currents exceeded 2.5 knots near the seafloor. Recovering the ADCP saved the Government $395,000. In congratulating the ESC ROV team, Captain Rudolph, Naval Oceanographic Office, stated, "Nobody does it better!"

For more information , contact **Dave Wicklund**, (805) 982-1191, DSN: 551-1191, e-mail: dwicklu@nfesc.navy.mil.

ESC Signs Educational Partnership Agreement With California University

The ESC has signed a unique agreement with the University of California, Santa Barbara (UCSB), which formally establishes an educational partnership between the two institutions. The agreement, based on Title 10 U. S. Code Section 2194, provides the framework for working jointly in areas of mutual interest in science and engineering by sharing personnel and facilities. It will be in effect for 36 months. **RADM David J. Nash**, Commander, Naval Facilities Engineering Command and **CAPT Donald G. Morris**, ESC Commanding Officer, represented the Navy at the April 24th signing. **Chancellor Henry T. Yang,** and **David J. Chapman**, Dean of Mathematical, Life and Physical Sciences, and Professor of biology, represented UCSB.

A gas chromatograph mass spectrometer was given to UCSB at the time of the signing. The instrument can accurately measure pollutants in the water, air, and earth's crust, and will serve as a valuable training and research tool for UCSB.

"The University and the ESC have enjoyed a mutually beneficial relationship for a number of years. This partnership agreement will add yet another dimension to that relationship and further contribute to the advance of science and engineering education. Through the partnership, we can more readily involve students and faculty in Navy research projects, loan laboratory equipment, or donate excess equipment to the university," declared RADM Nash.

(l to r) RADM Nash, CAPT Morris, and Chancellor Henry Yang

LCDR Mike Blumenberg, ESC's representative for implementing the partnership, noted, "Some of the research and some of the programs that we're going to jointly work on will have application nationwide. We may break new ground, which may have benefits for everybody!"

Desert Blast Certifies New Magazine

(Continued from page 1)

An HP magazine can be tailored for specific operational requirements. The primary facility cost of a nominal HP magazine capable of storing 300,000 pounds NEW of conventional ordnance is $2.3M (in FY98 dollars sited at Yorktown, VA). The primary facility cost of a nominal HP magazine capable of storing 150,000 pounds NEW of missiles is $2.0M. These costs must be adjusted to your locality.

The ESC, Navy Crane Center, Atlantic Division of NAVFAC, and the Packaging Handling, Storage and Transportation Center at Naval Weapons Station Earle, NJ, are teaming to complete a standard design for the HP magazine. NAVFAC will present the design criteria and siting criteria to the Department of Defense Explosives Safety Board for approval by the end of September 1997.

For more information, contact **James Tancreto** at (805) 982-1180, DSN: 551-1180, or e-mail: jtancre@nfesc.navy.mil.

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- ☐ Pier Power Monitoring Breakthrough by Ron Vincent
- ☐ High Performance Magazine by James Tancreto

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INSIDE

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